

was very dry. At Staunton and Stanardsville, Va., the month was unusually dry. At Woodbury, N. J., the month was the driest November in 5 years. At Charleston, Ill., the ground was very dry, and water scarce in creeks and wells. At Shreveport, La., the drought was broken on the 9th. At Fort Madison, Iowa, the month was very dry, and water for stock scarce. At Fayette, Mo., no rain fell after the 17th, and ponds and creeks were dry. At Red Bluff, Cal., rain was needed, the drought becoming severe by the 25th. At Grass Valley,

Cal., the month was very dry; no rain falling. At McMinnville, Oregon, the month was so dry that farmers were unable to plow.

○ PRAIRIE FIRES.

Near Webster, S. Dak., hundreds of tons of hay were destroyed by prairie fires from the 1st to 4th. On the 16th and 17th prairie fires destroyed hay and grain south of Fort Pembina, N. Dak.

○ VERIFICATIONS.

[Verifications made by Assistant Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Division.]

○ FORECASTS FOR 24 HOURS IN ADVANCE.

The forecasts for districts east of the Rocky Mountains for November, 1890, were made by Assistant Professor H. A. Hazen, Signal Service, and those for the Pacific coast districts were made at San Francisco, Cal., by 2d Lieutenant John P. Finley, Signal Corps.

Percentages of forecasts verified, November, 1890.

States.		States.	
Maine.....	82.4	Kentucky.....	85.0
New Hampshire.....	81.5	Ohio.....	79.1
Vermont.....	81.0	West Virginia.....	87.1
Massachusetts.....	81.5	Indiana.....	85.5
Rhode Island.....	85.9	Illinois.....	87.9
Connecticut.....	78.8	Lower Michigan.....	85.0
Eastern New York.....	80.3	Upper Michigan.....	77.1
Western New York.....	75.6	Wisconsin.....	87.8
Eastern Pennsylvania.....	85.2	Minnesota.....	87.5
Western Pennsylvania.....	82.7	Iowa.....	88.3
New Jersey.....	89.9	Kansas.....	85.1
Delaware.....	89.5	Nebraska.....	85.5
Maryland.....	88.4	Missouri.....	85.5
District of Columbia.....	88.1	Colorado.....	88.9
Virginia.....	85.3	North Dakota.....	85.7
North Carolina.....	90.0	South Dakota.....	86.7
South Carolina.....	90.4	Southern California*.....	95.9
Georgia.....	92.0	Northern California*.....	94.3
Eastern Florida.....	85.0	Oregon*.....	92.5
Western Florida.....	93.1	Washington*.....	88.1
Alabama.....	93.7	By elements: Weather.....	88.8
Mississippi.....	96.2	Temperature†.....	82.4
Louisiana.....	92.2	Monthly percentage of weather and temperature combined‡.....	86.2
Texas.....	87.6		
Arkansas.....	89.9		
Tennessee.....	87.9		

*In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. †The forecasts of temperature in districts east of the Rocky Mountains for November, 1890, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day. ‡The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

○ FORECASTS FOR 48 AND 72 HOURS IN ADVANCE.

Appreciating the great importance that long time predictions possess for the general public the Chief Signal Officer has authorized forecasts for 48 and 72 hours, covering the 2d and 3d days in advance. These are optional with the forecast official, and are only made when clearly in the public

interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 254; temperature, 78. Percentages of verifications: weather, 94.6; temperature, 86.7; weather and temperature combined, 93.3.

Percentages of verifications of forecasts made for third day in advance. Number of predictions made: weather, 12; temperature, 7. Percentages of verifications: weather, 95.0; temperature, 18.6; weather and temperature combined, 73.6.

○ WIND SIGNALS FOR NOVEMBER, 1890.

Statement showing percentages of justifications of wind signals for the month of November, 1890:

Wind signals.—(Ordered by Assistant Prof. H. A. Hazen). Total number ordered, 106; justified as to velocity, wholly, 79, partly, 3; justified as to direction, 99. Of the signals ordered 99 were cautionary, of which 74 were wholly, and 1 partly justified; and 7 were storm signals, of which 5 were wholly, and 2 partly justified. 21 signals were ordered for easterly winds, of which 16 were justified, and 85 were ordered for westerly winds, of which 83 were justified. Percentage of justifications, 69.9.

○ COLD-WAVE SIGNALS AND TEMPERATURE FALL WARNINGS.

[Ordered by Assistant Prof. T. Russell.]

Number of cold-wave signals ordered, 60; justified, 16. Percentage of justifications, 26.7. Number of temperature fall warnings, 6. Percentage of justifications, 100. Percentage of justifications of cold-wave signals and temperature-fall warnings combined, 30.2.

Percentages of verifications of weather and temperature signals reported by directors of the various State Weather Services for November, 1890.

States.	Weather.	Temperature.	States.	Weather.	Temperature.
Iowa.....	95	94	Nebraska.....	94	92
Illinois.....	87	81	New Jersey.....	89	87
Kansas.....	84	90	North and South Dakota.....	92	83
Michigan.....	90	90	Ohio.....	92	87
Minnesota.....	86	76	Pennsylvania.....	85	87

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for November, 1890, of the directors of the various state weather services:

○ ALABAMA.

Temperature.—The mean was 4.4 above the normal; maximum, 85, at Citronelle, 1st and 12th; minimum, 23, at Valley Head, 1st and 4th; greatest monthly range, 69, at Valley Head; least monthly range, 39, at Union Springs.

Precipitation.—The average was 8.25 below the normal; greatest monthly, 1.79, at Uniontown; least monthly, 0.00, at Bermuda and Columbiana.

Wind.—Prevailing direction, northwest.—Prof. P. H. Mell, Auburn, director; J. M. Quarles, Private, Signal Corps, assistant.

○ ARKANSAS.

Temperature.—The mean was 8.8 above the normal; maximum, 84, at Rus-

sellville, 12th; minimum, 25, at Devall's Bluff, 27th; greatest monthly range, 54, at Russellville and Lead Hill; least monthly range, 38, at Ozona.

Precipitation.—The average was about the normal for the last 8 years; greatest monthly, 7.10, at Harrisburgh; least monthly, 2.85, at Camden.—M. F. Locke, Commissioner of Agriculture, Little Rock, director; F. H. Clarke, Sergeant, Signal Corps, assistant.

○ COLORADO.

Temperature.—The mean was 8.5 above the normal; maximum, 88, at River Bend, 17th; minimum, —20, at Breckenridge, 15th; greatest monthly range, 100, at Breckenridge; least monthly range, 80, at Kit Carson.